

What is Claimed:

1. A method for making a catalyst comprising the steps of:
forming a silica component;
washing said silica component;
contacting said silica component with an aqueous, alkaline bath
comprising a catalytic metal to impregnate said silica component with said catalytic
metal to form an activated silica component; and
drying said activated silica component to form said catalyst.

2. The method in accordance with claim 1, wherein said alkaline bath has a pH of between about 7.5 and 10 at the end of the metal impregnation.

3. The method in accordance with claim 2, wherein said alkaline bath has a pH of between about 8 and 9.5 at the end of the metal impregnation.

4. The method in accordance with claim 1, wherein said alkaline bath further comprises a salt of said catalytic metal and ammonium hydroxide, wherein said catalytic metal is selected from the group consisting of alkali metal and alkaline earth metal.

5. The method in accordance with claim 4, wherein said catalytic metal is cesium and said salt is cesium carbonate.

6. The method in accordance with claim 1, wherein said silica component comprises silica gel and the step of forming said silica gel comprises mixing an alkali metal silicate with a mineral acid to form a hydrosol and allowing said hydrosol to set.

7. The method in accordance with claim 1, wherein said silica component comprises a co-gel and the step of forming said co-gel comprises combining an alkali metal silicate, a mineral acid, and a source of a second metal to form a hydrosol and allowing said hydrosol to set.

8. The method in accordance with claim 7, wherein the combining step comprises first mixing said mineral acid with said source of said second metal to form a mixture then combining said alkali metal silicate with said mixture.

1 9. The method in accordance with claim 7, wherein said second
2 metal is selected from the group consisting of zirconium, titanium, aluminum, and Fe.

1 10. The method in accordance with claim 9, wherein said second
2 metal is zirconium and said source of zirconium is zirconium orthosulfate.

1 11. The method in accordance with claim 1, wherein the washing step
2 comprises acidifying said silica component and then washing said acidified silica
3 component with acidified water.

1 12. The method in accordance with claim 11, wherein the pH of said
2 acidified silica component is about 1.5 to 2.5, and the pH of said acidified water is
3 about 2.5 to 4.

1 13. The method in accordance with claim 1, wherein the washing step
2 comprises washing said silica component with an aqueous ammonium sulfate solution
3 then with neutral water.

1 14. The method in accordance with claim 1 further comprising, prior
2 to the washing step, heating said silica component in an alkaline hydrothermal
3 solution.

1 15. The method in accordance with claim 1 further comprising
2 calcining said dried catalyst.

1 16. The method in accordance with claim 1, wherein said alkaline
2 bath further comprises ammonium hydroxide.

1 17. The product made by the process of claim 1.

1 18. A method for making a catalyst comprising the steps of:
2 combining an alkali metal silicate, a mineral acid, and a source of
3 zirconium to form a hydrosol and allowing said hydrosol to set to form a co-gel;
4 washing said co-gel;
5 contacting said silica component with an aqueous, alkaline bath
6 comprising cesium to impregnate said co-gel with said cesium to form an activated
7 silica component, wherein said bath has a pH between and 8 and 9.5 at the end of the
8 metal impregnation; and
9 drying said activated silica component to form said catalyst.

19. The product made by the process of claim 18.